

# INTELLIGENT LIFE SAVING HELMET DETECTING SYSTEM USING MSP430

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*Abstract-Nowadays almost all countries are making the use of helmets mandatory and cracking down strictly on drunken driving. But still in many places, the rules are being violated. This intelligent helmet system describes the interaction between modules mounted on the vehicle and helmet to ensure the vehicle can be started only when the user is wearing a helmet and is not under the influence of alcohol. Alcohol detection is done by MQ-3 sensor and helmet detection is done by IR and alcohol. The helmet will be connected to vehicle key ignition systems which will be electronically controlled. During the ignition starts, the current location of the vehicle can be identified by receiving the message from the GSM to the user. The main purpose of the paper is to encourage wearing helmet. The system will ensure that the motorbike will not start unless the rider is wearing a helmet and has not consumed alcohol.*

**Keywords:**IR sensor, Alcohol sensor, GSM, LCD, Ignition system

## I. INTRODUCTION

The number of two wheelers, especially the craze among youngsters. In accordance with the growth of number of two wheelers safety factor also rises. To prevent the human life from road accidents an automated safety system is needed. The major reasons in road accidents are drunken driving and driving without helmet. Road accidents have earned India a dubious distinction. With over 130,000 deaths annually, the country has overtaken China and now has the worst road traffic accident rate worldwide. This has been revealed by the World Health Organization (WHO) in its first ever Global Status Report on Road Safety. The report pointed to speeding, drunk driving and less use of helmets. Drunken driving was a major factor of road accidents and mostly they are due to bike accidents.

The number of two wheelers are growing, especially the craze among youngsters. The people are buying the two wheelers which are faster and powerful. In accordance with the growth of the number of two wheelers the safety factor also rises. There a lot of accidents those are happening every day on the roads. There are certain causes which are responsible for it. Certain reasons are responsible for it such as drivers fault, bad road, and mistake from other person on road. These are the two main issues which inspires us to build this paper. The first step will be helmet detection and alcohol detection. When these two conditions are checked then only the bike ignition will start. IR sensor and MQ-3 alcohol sensor is used for the same.

## II .LITERATURE SURVEY

AboliRavindraWakure,et al., describes that, the applications which are developed in terms of some electronic and individual existing components will be independently executed even though there are some drawbacks and disadvantages for its existing criteria of requirements. More precisely the extent in these sort of stand-alone applications were formed together to state them as Embedded System applications.

Cardullo, et al., describes that a vehicle within a radio coverage range can communicate by using multi-hop communication without the support of the Fixed Road Side unit. Most of the previous works on routing protocols have been established for Mobile Ad-hoc Networks. Only a limited work has been done on vehicle to vehicle communication inside the city. But no major attempt has been so far made on vehicular communication outside the city area.

Haran PC, et al., explained that a real-time vision-based motorcycle monitoring system that can be used to detect and track motorcycles in a sequence of images. The system used a moving object detection method and resolved occlusive problems using a proposed occlusive detection and segmentation method. Each motorcycle was detected by proposed helmet detection or search methods. The proposed occlusive detection and segmentation method used the visual length, visual width, and pixel ratio to identify classes of motorcycle occlusions and segment the motorcycle from each occlusive class.

MonaliJadhav, et al., explained that sweat sensors, Saab Alco Key, straw like tube on the driver seat are used to check drunken condition of the drivers in cars. But these devices lead to misreading; inaccurate testing and circuit complexity is high. HongjieLeng and Yingzi Lin developed a novel carbon nanotube (CNT)-based alcohol sensor with a particular focus on the response delay problem presented in CNT based sensors. William R. Reagen developed a system for locating missing vehicles. Shegeyuki Kojima et al designed a new algorithm to distinguish between the normal and intoxicated state of a person which is proposed as the basic theory of the sensing system. The entire solution requires only a mobile phone placed in vehicle and with accelerometer and orientation sensor.

### III.METHODOLOGY BLOCK DIAGRAM:

The main focus is on avoidance of drunken driving and helmet detection. Hence this system will not turn on the vehicle, when the user is in drunken condition or the helmet is not worn. The below figure shows the block diagram of intelligent life saving helmet system.

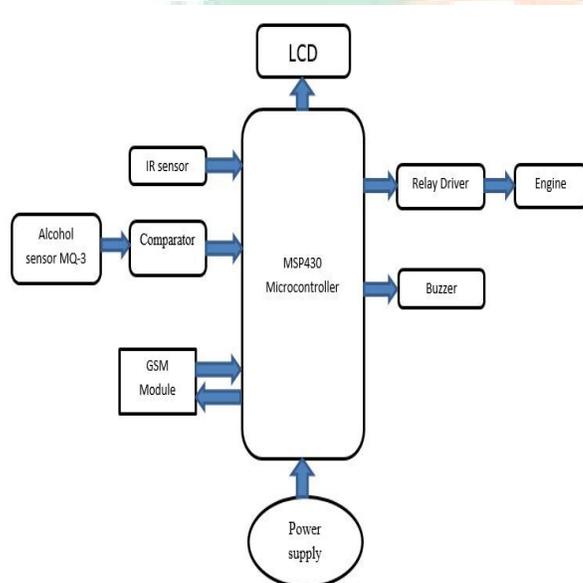


Fig1: Block diagram of intelligent life saving helmet detecting system using msp430

#### A. IR Sensor

Infrared sensor is used to ensure that the rider will wear the helmet. This sensor is placed on either side of the helmet which forms a closed circuit when the rider wears the helmet IR detects and the information is passed to the microcontroller. Infrared (IR) provides invisible radiant energy, electromagnetic radiation with longer wavelengths than those of visible light, extending from the nominal red edge of the visible spectrum at 700 nanometers (frequency 430 THz) to 1 mm (300 GHz) (although people can see infrared up to at least 1050 nm in experiments). Most of the thermal radiation emitted.

by objects near room temperature is infrared. IR detectors are little microchips with a photocell that are tuned to listen to infrared light. They are almost always used for remote control detection - every TV and DVD player has one of these in the front to listen for the IR signal from the clicker. Inside the remote control is a matching IR LED, which emits IR pulses to tell the TV to turn on, off or change channels. IR light is not visible to the human eye, which means it takes a little more work to test a setup. In this paper IR sensor is preferred more than others as it is of low cost and it accurately detects human interface when compared to others.

#### B. Alcohol Sensor

MQ-3 gas sensor (alcohol sensor) is suitable for detecting alcohol content from the breath. This alcohol sensor is

suitable for detecting alcohol concentration on breath, just like common Breathalyzer. It is placed near the mouth of the rider in the helmet. It has a high sensitivity and fast response time. Sensor provides an analog resistive output based on alcohol concentration. The drive circuit is very simple as all it needs is one resistor. A simple interface could be a 0-3.3V ADC. It is impossible for police to check each and every vehicle for drunken drivers, so an effective system which automatically prevents drunken driving is needed. This system can be integrated with the ignition system thus allowing only sober people to handle the motorbike.

### C.LCD

A liquid-crystal display (LCD) is a flat-panel display or other electronic visual display that uses the light-modulating properties of liquid crystals. Liquid crystals do not emit light directly. LCDs are used in a wide range of applications including computer monitors, televisions, instrument panels, aircraft cockpit displays, and signage. They are common in consumer devices such as devices, clocks, watches, calculators, and telephones, and have replaced cathode ray tube (CRT) displays in nearly all applications. They are available in a wider range of screen sizes than CRT and plasma displays, and since they do not use phosphors, they do not suffer image burn-in. LCDs are, however, susceptible to image persistence.

### D.MSP430 Microcontroller

The Texas Instruments MSP430 family of ultra-low-power microcontrollers consists of several devices featuring different sets of peripherals targeted for various applications. The architecture, combined with five low-power modes, is optimized to achieve extended battery life in portable measurement applications. The device features a powerful 16-bit RISC CPU, 16-bit registers, and constant generators that contribute to maximum code efficiency. The digitally controlled oscillator (DCO) allows wake-up from low-power modes to active mode in less than 1  $\mu$ s. It helps to control the ignition system of the two-wheelers.

## IV.WORKING PRINCIPLE:

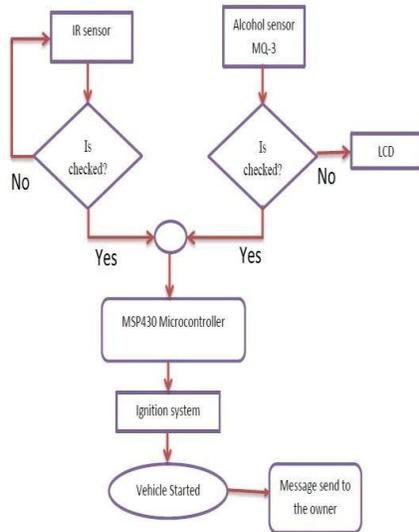


Fig2: Flow chart intelligent life saving helmet detecting system using msp430

The intelligent life saving helmet system operation is mainly based on the two sensors- IR sensor and Alcohol sensor. IR sensor is placed on the either side of the helmet. Infrared wave is transmitted continuously and it is detected by the sensor. The signal gets interrupted when the user wears the helmet. This interruption will give a positive signal to the controller to start the ignition system of two wheelers. Until the signal interrupted the sensor continuously sense whether the helmet is present or not. In the meanwhile alcohol sensor detects the user is drunken or not. If the rider drinks alcohol alcohol sensor detects alcohol level from rider's breath. If the rider is in drunken condition, the controller sends signal to the LCD which flashes the message. The vehicle starts only when the sensor gives a positive signal to the controller. Both the helmet detection and alcohol detection are done simultaneously. The ignition system of two wheeler works when both conditions are satisfied i.e., the rider wears helmet and not consumes alcohol. Finally, GSM technique is used to send message to the phone about the

ignition of the two wheeler to the user.

## V.RESULTS:

An intelligent life saving helmet detecting system using msp430 a special idea which makes motorcycle driving safer than before. This is implemented using GSM. The working of this helmet is very simple, IR sensors are placed in different places of helmet where the probability of hitting is more which are connected to microcontroller board. So when the rider wears the helmet, these sensors sense and gives to the microcontroller board, then controller insists to the GSM module that is interfaced to it. When the rider wear the helmet GSM module automatically sends message to rider.

## VI.CONCLUSION:

Absence of helmet or drunken driving is the major cause for many motorbike accidents. Although there were many modules developed based on accident prevention, they are concentrated mostly on four wheelers. There are very less ideas are concentrated on two wheelers safety but most of the accidents happened in motorbike when compared to four wheelers. The intelligent life saving helmet system is concentrated mainly on bike rider's safety.

By introducing this smart technology head injuries are minimized during accidents. In addition to that accidents happen due to drunken driving are also decreased. This paper ensures bike rider's safety and security.

This paper provides a safe driving using intelligent helmet system and it measures the alcohol content of the rider and allows the vehicle to start which inspite saves the human life.

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